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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No.	Applicant(s)	
	10/037,085	MAXHAM, KENNETH M.	
	Examiner	Art Unit	
	Christina Y. Leung	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 April 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-14 and 28* is/are allowed.

6)☒ Claim(s) *15-27 and 29-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. **Claims 15-27 and 29-31** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Cardwell et al.** (US 2002/00366988 A1) in view of **Beine et al.** (US 6,304,347 B1) and **Ramamurthy et al.** ("Optimizing Amplifier Placements in a Multiwavelength Optical LAN/MAN: The Unequally Powered Wavelengths Case," IEEE/ACM Transactions on Networking, Vol. 6, No. 6, December 1998, pp. 755-767).

Regarding claim 15, Cardwell et al. disclose a computer implemented method for designing a wavelength division multiplexed optical network (Figure 5), the method comprising:

providing an interface for a user to input an arrangement of optical nodes coupled by optical fiber spans (page 5, paragraphs [0055]-[0058]; page 6, paragraphs [0061]-0062]), each of the optical fiber spans having an associated optical fiber loss that is dependent upon its length and upon an attenuation characteristic of the span (page 7, paragraph [0076]), wherein the arrangement comprises one of a ring, mesh, and combination thereof (Figures 1-4 show nodes connected together as rings or as ring/mesh combinations);

the optical network having an associated multiplicity of possible optical amplifier placement configurations;

for each node of the optical network, configuring optical components of optical add/drop multiplexers to add, drop, and pass through optical wavelength channels according to a channel map for providing services in the optical network, the optical components of the node having an associated optical loss characteristic (page 6, paragraphs [0062]-[0064]);

selecting optical services between the optical nodes, wherein the optical services comprise a plurality of channels, wherein each of the plurality of channels comprises a source node and a destination node (page 3, paragraph [0026]; page 4, paragraphs [0043]-[0047]);

selecting a set of optical amplifier placement configurations, the selection constrained by a node loss algorithm wherein it is determined if a given node has an internal node loss for one or more of the plurality of channels that exceeds a predetermined level (page 6, paragraph [0068]; page 7, paragraph [0076]); and a sequential path search algorithm wherein the power characteristics of one or more of the plurality channels are analyzed from source node to the destination node (page 4, paragraph [0043]; page 7, paragraph [0076]);

analyzing quality of service for each optical amplifier placement configuration in the set of optical amplifier placement configurations, wherein the quality of service comprises power level of every channel in the channel map (page 6, paragraph [0065] and [0068]; page 7, paragraph [0076]); and

selecting an optical amplifier placement configuration having a desired quality of service (page 8, paragraphs [0079]-[0082]).

With respect to a node loss algorithm, Examiner respectfully notes that Cardwell et al. disclose that the constraining criterion includes "an additional loss component for splicing through an intermediate office--an office loss in dB per office. The office loss is included to

more accurately model metropolitan areas where distances are short but many offices are used as via points" (page 6, paragraph [0068]). Further regarding a node loss algorithm, Cardwell et al. also disclose that the criterion includes "a loss per office for each office or node 12 traversed without a multiplexer. Thus a 'through' office or node 12 will add to the signal loss" (page 7, paragraph [0076]).

With respect to a sequential path search algorithm, Examiner respectfully notes that Cardwell et al. disclose that the constraining criterion also includes "calculat[ing] the signal loss for each link between add/drop multiplexers on the ring. If the loss thus calculated exceeds the loss allowed by the multiplexer...routine 116 will insert an amplifier (in the case of DWDM) at the last office or node before the loss budget was exceeded" (page 7, paragraph [0076]). In other words, Cardwell et al. disclose that the constraining criterion includes analyzing the power characteristics of one or more channels from add point (one add/drop multiplexer) to drop point (another add/drop multiplexer).

Further regarding claim 15, Cardwell et al. disclose that each node is capable of generally receiving amplifiers, but they do not specifically disclose pre-amplifiers and post-amplifiers. However, Beine et al. teach a related optical network with nodes coupled by fiber optic spans (Figure 21) and further teach nodes capable of receiving at least one optical pre-amplifier for each input fiber and at least one optical post amplifier for each output fiber (such as amplifiers 2102 and 2106, for example; column 36, lines 38-53). It would have been obvious to a person of ordinary skill in the art to specifically have the nodes disclosed by Cardwell et al. capable of receiving both pre- and post-amplifiers as suggested by Beine et al. in order to provide more

flexibility in the placement of the amplifiers and thereby better optimize the design of the network.

Further regarding claim 15, although Cardwell et al. also disclose that the quality of service comprises analyzing noise caused by amplifiers (page 6, paragraph [0065]; page 7, paragraph [0076]), Cardwell et al. do not specifically disclose that the quality of service comprises one or more of optical signal to noise ratio, bit error, rate, and combination thereof.

However, it is well understood in the optical communications art that it is generally desirable for signals to be transmitted with reduced noise (and therefore, a higher signal to noise ratio) in order to ensure that the data in the signals is properly received. Beine et al. in particular further teach analyzing both power characteristics and optical signal to noise ratios of channels in the network (column 2, lines 43-67; column 3, lines 1-15).

It would have been obvious to a person of ordinary skill in the art to analyze a optical signal to noise ratio as suggested by Beine et al. in the system disclosed by Cardwell et al. in order to limit noise in the signals and ensure that the data in the signals is properly received. Again, Cardwell et al. already generally disclose analyzing noise caused by amplifiers.

Further regarding claim 15, Cardwell et al. do not specifically disclose selecting a minimum number of amplifiers, but they do disclose attempting to minimize overall cost (page 2, paragraph [0021]), and it is well understood in the art that reducing the number of amplifiers would generally contribute to reducing an overall cost of the designed system.

Ramamurthy et al. teach a related system for designing an optical wavelength division multiplexing network (Abstract) including placing optical amplifiers, and they further teach

minimizing the number of amplifiers placed in the network (Abstract, particularly lines 7-9; see also page 756, section "B. Problem Definition").

It would have been obvious to a person of ordinary skill in the art to select a minimum number of amplifiers as taught by Ramamurthy et al. in the system disclosed by Cardwell et al. in order to minimize the cost of the designed network and also in order to advantageously reduce associated noise and maintenance considerations for each amplifier (Ramamurthy et al., page 756, second paragraph under section "B. Problem Definition").

Regarding claim 27, Cardwell et all. in view of Beine et al. and Ramamurthy et al. suggest an optical network designed by the method of claim 15 as discussed above.

Regarding claim 16, Cardwell et al. disclose that selecting the set comprises:

selecting an optical power criterion for constraining placement of one or more optical amplifiers in the optical network, the optical power criterion being indicative of a sufficient minimum received power in at least one receiver (page 5, paragraph [0058]; page 6, paragraphs [0065] and [0068]);

placing at least one amplifier in accord with the optical power criterion to form an initial placement of amplifiers (page 7, paragraph [0076]); and

determining a set of amplifier placement configurations which are consistent with the initial placement of amplifiers (page 8, paragraphs [0079]-[0081])..

Regarding claim 17, Cardwell et al. disclose that selecting the set comprises:

for a node having at least one channel passing through the node, determining a pass-through optical loss associated with the at least one channel passing through the optical node;

responsive to the pass-through optical loss exceeding a threshold loss, placing at least one amplifier in the node (page 6, paragraph [0068].

Regarding claim 18, Cardwell et al. disclose that selecting the set comprises:

for at least one optical wavelength channel, forming an equivalent optical circuit model having an associated equivalent optical loss to couple a wavelength channel from a first node to a second node in the network; and responsive to the equivalent optical loss exceeding a threshold optical loss, placing an optical amplifier in at least one of the nodes (page 7, paragraph [0076]).

Regarding claim 19, Cardwell et al. disclose that the first and second nodes comprise an optical add/drop path, the minimum equivalent loss includes the losses along the add/drop path, and the optical amplifier is placed in one of the nodes along the add/drop path (page 7, paragraph [0076]).

Regarding claim 20, Cardwell et al. disclose that selecting the set comprises:

for at least one optical wavelength channel that is added and dropped, sequentially moving from an add node to each subsequent node along an optical path to a drop node;

at each node in the sequence of nodes along the optical path, determining if an optical amplifier is required to couple the optical wavelength signal to a subsequent node; and

responsive to determining that an optical amplifier is required to couple the optical wavelength channel to a subsequent node, placing an amplifier in a node location selected to couple the optical wavelength signal to the subsequent node (page 7, paragraph [0076]);.

Regarding claim 21, Cardwell et al. disclose:

performing a power analysis of the wavelength channel along the optical path for an initial optical amplifier configuration; and

responsive to the wavelength channel having a power level below a threshold power level in a node, placing an optical amplifier in a previous node (page 6, paragraph [0068]; page 7, [0076]).

Regarding claim 22, Cardwell et al. disclose that selecting the set comprises: placing amplifiers proximate high loss regions of the optical network (page 7, paragraph [0076]).

Regarding claim 23, Cardwell et al. disclose that selecting the set further comprises: eliminating from consideration amplifier configurations belonging to branches of a decision tree likely to have unacceptably low power for at least one wavelength channel in at least one node (page 6, paragraph [0068]; page 7, paragraphs [0076]-[0077]).

Regarding claim 24, Cardwell et al. disclose that selecting the set comprises:

placing an optical amplifier in a node, responsive to the optical loss of the node for at least one pass-through channel exceeding a first threshold loss; and

placing at least one amplifier proximate one end of a span responsive to determining a path loss for a wavelength channel added in a first node traveling along an optical path including the span to a second node exceeding a second threshold loss (page 7, paragraph [0076]).

Examiner notes that Cardwell et al. disclose placing optical amplifiers in nodes wherever the loss of a signal has exceeded a threshold loss for a given link. Different links would have different loss characteristics and so the system disclosed by Cardwell et al. is capable of placing an amplifier when the loss on one link has exceeded a first threshold and another amplifier when the loss on another link has exceeded a second threshold.

Regarding claim 25, Cardwell et al. disclose forming configurations having at least one additional optical amplifier (i.e., they disclose placing however many amplifiers as needed).

Regarding claim 26, Cardwell et al. in view of Beine et al. and Ramamurthy et al. describe a method as discussed above with regard to claim 15. Cardwell et al. do not specifically disclose selecting the amplifier placement by calculating an aggregate loss or determining an aggregate number of amplifiers.

However, Ramamurthy et al. teach a related system for designing an optical wavelength division multiplexing network (Abstract) including placing optical amplifiers, and they further teach minimizing the number of amplifiers placed in the network by calculating an aggregate loss of the network spans and nodes and determining an aggregate number of amplifiers required for the aggregate optical loss (Abstract, particularly lines 7-9; see also page 756, section "B. Problem Definition").

Cardwell et al. already disclose attempting to minimize overall cost (page 2, paragraph [0021]), and it is well understood in the art that reducing the number of amplifiers would generally contribute to reducing an overall cost of the designed system.

Regarding claim 26, it would have been obvious to a person of ordinary skill in the art to select a minimum number of amplifiers by calculating an aggregate loss as taught by Ramamurthy et al. in the method described by Cardwell et al. in view of Beine et al. and Ramamurthy et al. in order to minimize the cost of the designed network and also in order to advantageously reduce associated noise and maintenance considerations for each amplifier (Ramamurthy et al., page 756, second paragraph under section "B. Problem Definition").

Regarding claim 29, Cardwell et al. disclose a network design tool (Figure 5), comprising:

a network configuration module (including step 111 in Figure 5; page 7, paragraph [0071]) for configuring optical components of nodes of an optical network to add, drop, and pass-through wavelength channels according to a channel map, wherein the optical network is configured in a mesh, ring, or combination thereof topology (Figures 1-4 show nodes connected together as rings or as ring/mesh combinations);

an amplifier placement selection module (including step 116) for selecting a subset of amplifier placement configurations from the set of all possible amplifier placement configurations, the selection constrained by a node loss algorithm wherein it is determined if a given node has an internal node loss for one or more channels that exceeds a predetermined level (page 6, paragraph [0068]; page 7, paragraph [0076]); and a sequential path search algorithm wherein the power characteristics of one or more channels are analyzed from add point to drop point (page 7, paragraph [0076]);

a quality of service analysis module (including step 118; page 8, paragraph [0079]) configured to analyze the quality of service for each amplifier configuration of the subset of amplifier placement configurations and select an amplifier configuration having a desired quality of service, wherein the quality of service comprises power level of every channel in the channel map (page 7, paragraph [0076]).

With respect to a node loss algorithm, Examiner respectfully notes that Cardwell et al. disclose that the constraining criterion includes "an additional loss component for splicing through an intermediate office--an office loss in dB per office. The office loss is included to more accurately model metropolitan areas where distances are short but many offices are used as via points" (page 6, paragraph [0068]). Further regarding a node loss algorithm, Cardwell et al.

also disclose that the criterion includes "a loss per office for each office or node 12 traversed without a multiplexer. Thus a 'through' office or node 12 will add to the signal loss" (page 7, paragraph [0076]).

With respect to a sequential path search algorithm, Examiner respectfully notes that Cardwell et al. disclose that the constraining criterion also includes "calculat[ing] the signal loss for each link between add/drop multiplexers on the ring. If the loss thus calculated exceeds the loss allowed by the multiplexer...routine 116 will insert an amplifier (in the case of DWDM) at the last office or node before the loss budget was exceeded" (page 7, paragraph [0076]). In other words, Cardwell et al. disclose that the constraining criterion includes analyzing the power characteristics of one or more channels from add point (one add/drop multiplexer) to drop point (another add/drop multiplexer).

Further regarding claim 29, although Cardwell et al. also disclose that the quality of service comprises analyzing noise caused by amplifiers (page 6, paragraph [0065]; page 7, paragraph [0076]), Cardwell et al. do not specifically disclose that the quality of service comprises one or more of optical signal to noise ratio, bit error, rate, and combination thereof. Cardwell et al. also do not specifically disclose that the quality of service analysis module is further configured to perform power balancing.

However, it is well understood in the optical communications art that it is generally desirable for signals to be transmitted with reduced noise (and therefore, a higher signal to noise ratio) in order to ensure that the data in the signals is properly received. Beine et al. in particular teach a related optical network with nodes coupled by fiber optic spans (Figure 21) and further teach analyzing both power characteristics and optical signal to noise ratios of channels in the

network (column 2, lines 43-67; column 3, lines 1-15). Beine et al. also teach power balancing (column 7, lines 30-48).

It would have been obvious to a person of ordinary skill in the art to analyze a optical signal to noise ratio as suggested by Beine et al. in the system disclosed by Cardwell et al. in order to limit noise in the signals and ensure that the data in the signals is properly received. Again, Cardwell et al. already generally disclose analyzing noise caused by amplifiers. It also would have been obvious to a person of ordinary skill in the art to perform power balancing as taught by Beine et al. in the system disclosed by Cardwell et al. in order to prevent non-linear effects in the signals (Beine et al., column 7, lines 44-48).

Further regarding claim 29, Cardwell et al. do not specifically disclose selecting a minimum number of amplifiers, but they do disclose attempting to minimize overall cost (page 2, paragraph [0021]), and it is well understood in the art that reducing the number of amplifiers would generally contribute to reducing an overall cost of the designed system.

Ramamurthy et al. teach a related system for designing an optical wavelength division multiplexing network (Abstract) including placing optical amplifiers, and they further teach minimizing the number of amplifiers placed in the network (Abstract, particularly lines 7-9; see also page 756, section "B. Problem Definition").

It would have been obvious to a person of ordinary skill in the art to select a minimum number of amplifiers as taught by Ramamurthy et al. in the system disclosed by Cardwell et al. in order to minimize the cost of the designed network and also in order to advantageously reduce associated noise and maintenance considerations for each amplifier (Ramamurthy et al., page 756, second paragraph under section "B. Problem Definition").

Regarding claim 30, Cardwell et al. disclose that the amplifier placement selection module places amplifiers proximate high loss regions of the optical network (page 6, paragraph [0068]).

Regarding claim 31, Cardwell et al. disclose that the amplifier placement selection module eliminates from consideration amplifier configurations belonging to branches of a decision tree likely to have unacceptably low power for at least one wavelength channel in at least one node (page 6, paragraph [0068]; page 7, paragraphs [0076]-[0077]).

3. **Claims 32 and 34** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Cardwell et al.** in view of **Beine et al.**

Regarding claim 32, Cardwell et al. disclose a wavelength division multiplexed optical network (Figures 1-4), comprising:

at least four optical nodes coupled by fiber optic spans, each node having an optical add/drop multiplexer (Figure 4 shows four nodes 18, 20, 22b, and 24b with add/drop multiplexers), wherein the optical network is configured in a mesh, ring, or combination thereof topology (Figures 1-4 show nodes connected together as rings or as ring/mesh combinations); and

at least one optical amplifier disposed in the nodes, wherein the configuration of the at least one optical amplifier is selected and validated by a design tool, the selection constrained by a node loss algorithm wherein it is determined if a given node has an internal node loss for one or more channels that exceeds a predetermined level (page 6, paragraph [0068]; page 7, paragraph [0076]); and a sequential path search algorithm wherein the power characteristics of one or more channels are analyzed from add point to drop point (page 7, paragraph [0076]).

With respect to a node loss algorithm, Examiner respectfully notes that Cardwell et al. disclose that the constraining criterion includes "an additional loss component for splicing through an intermediate office--an office loss in dB per office. The office loss is included to more accurately model metropolitan areas where distances are short but many offices are used as via points" (page 6, paragraph [0068]). Further regarding a node loss algorithm, Cardwell et al. also disclose that the criterion includes "a loss per office for each office or node 12 traversed without a multiplexer. Thus a 'through' office or node 12 will add to the signal loss" (page 7, paragraph [0076]).

With respect to a sequential path search algorithm, Examiner respectfully notes that Cardwell et al. disclose that the constraining criterion also includes "calculat[ing] the signal loss for each link between add/drop multiplexers on the ring. If the loss thus calculated exceeds the loss allowed by the multiplexer...routine 116 will insert an amplifier (in the case of DWDM) at the last office or node before the loss budget was exceeded" (page 7, paragraph [0076]). In other words, Cardwell et al. disclose that the constraining criterion includes analyzing the power characteristics of one or more channels from add point (one add/drop multiplexer) to drop point (another add/drop multiplexer).

Further regarding claim 32, Cardwell et al. also disclose that the sequential path search algorithm also includes analyzing noise caused by amplifiers ("Routine 116 tracks loss and amplifier noise during the ring simulation in order to place the proper equipment in the correct location"; page 7, paragraph [0076]; see also page 6, paragraph [0065]). Although Cardwell et al. do not explicitly disclose analyzing one of optical signal to noise ratio, bit error rate, and combination thereof, it is well understood in the optical communications art that it is generally

desirable for signals to be transmitted with reduced noise (and therefore, a higher signal to noise ratio) in order to ensure that the data in the signals is properly received. Beine et al. in particular teach a related optical network with nodes coupled by fiber optic spans (Figure 21) and further teach analyzing both power characteristics and optical signal to noise ratios of channels in the network (column 2, lines 43-67; column 3, lines 1-15). It would have been obvious to a person of ordinary skill in the art to analyze a optical signal to noise ratio as suggested by Beine et al. in the system disclosed by Cardwell et al. in order to limit noise in the signals and ensure that the data in the signals is properly received. Again, Cardwell et al. already generally discloses analyzing noise caused by amplifiers.

Further regarding claim 32, Cardwell et al. disclose that each node is capable of generally receiving amplifiers, but they do not specifically disclose pre-amplifiers and post-amplifiers. However, Beine et al. further teach nodes capable of receiving at least one optical pre-amplifier for each input fiber and at least one optical post amplifier for each output fiber (such as amplifiers 2102 and 2106, for example; column 36, lines 38-53). It would have been obvious to a person of ordinary skill in the art to specifically have the nodes disclosed by Cardwell et al. capable of receiving both pre- and post-amplifiers as suggested by Beine et al. in order to provide more flexibility in the placement of the amplifiers and thereby better optimize the design of the network.

Regarding claim 34, Cardwell et al. disclose that the network has at least five nodes (Figures 1-4 show more than five nodes in a network).

4. **Claim 33** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Cardwell et al.** in view of **Beine et al.** as applied to claim 32 above, and further in view of **Sharma et al.** (US 6,046,833 A).

Regarding claim 33, Cardwell et al. in view of Beine et al. describe a system as discussed above with regard to claim 32. Cardwell et al. further disclose OC-3, OC-12, and OC-48 services (page 9, Table 2) but do not specifically disclose OC-192 compliant services. However, OC-192 compliant services are also well known in the art in optical networks, as Sharma et al. specifically suggest (column 2, lines 11-24). It would have been obvious to a person of ordinary skill in the art to specifically use OC-192 compliant services as taught by Sharma et al. in the network described by Cardwell et al. in view of Beine et al. in order to accommodate greater transmission rates and deliver large amounts of communication more efficiently.

5. **Claim 35** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Cardwell et al.** in view of **Beine et al.** as applied to claim 32 above, and further in view of **Ramamurthy et al.**

Regarding claim 35, Cardwell et al. in view of Beine et al. describe a system as discussed above with regard to claim 32. Cardwell et al. further disclose that design tool performs the steps of:

selecting a subset of optical amplifier placement configurations (page 5, paragraphs [0056]-[0058]);

analyzing quality of service for each optical amplifier placement configuration in the subset of optical amplifier placement configuration (Figure 5; page 3, paragraph [0026]; page 6, paragraph [0065] and [0068]; page 7, paragraphs [0071]-[0078]); and

selecting an optical amplifier placement configuration having a desired quality of service (page 8, paragraphs [0079]-[0082]).

Cardwell et al. do not specifically disclose selecting a minimum number of amplifiers, but they do disclose attempting to minimize overall cost (page 2, paragraph [0021]), and it is well understood in the art that reducing the number of amplifiers would generally contribute to reducing an overall cost of the designed system.

Ramamurthy et al. teach a related system for designing an optical wavelength division multiplexing network (Abstract) including placing optical amplifiers, and they further teach minimizing the number of amplifiers placed in the network (Abstract, particularly lines 7-9; see also page 756, section "B. Problem Definition").

It would have been obvious to a person of ordinary skill in the art to select a minimum number of amplifiers as taught by Ramamurthy et al. in the system disclosed by Cardwell et al. in order to minimize the cost of the designed network and also in order to advantageously reduce associated noise and maintenance considerations for each amplifier (Ramamurthy et al., page 756, second paragraph under section "B. Problem Definition").

Allowable Subject Matter

6. Claims 1-14 and 28 are allowed.

7. The following is a statement of reasons for the indication of allowable subject matter:

The prior art, including Cardwell et al., Beine et al., Ramamurthy et al., and Sharma et al., does not specifically disclose or fairly suggest an apparatus or method including all of the elements, steps, and limitations in the particular combination recited in independent claims 1, 8, and 28.

Response to Arguments

8. Applicant's arguments with respect to claims 29-31 have been considered but are moot in view of the new ground(s) of rejection (over Cardwell et al. in view of Beine et al. and Ramamurthy et al., instead of only Cardwell et al. in view of Ramamurthy et al.). Also, Applicant's arguments filed 20 April 2007 with regard to the teachings of the references as applied in the rejections of claims 15-27 and 32-35, and also in general with regard to claims 29-31, have been fully considered but they are not persuasive.

9. Examiner respectfully disagrees with Applicant's assertion on page 14 that "Cardwell et al. focuses solely on rings, not mesh and ring/mesh combination topologies" and therefore does not disclose limitations in the claims regarding the optical network being "configured in a mesh, ring, or combination thereof topology." First, Examiner respectfully notes that claims 15-27 and 29-35 only recite that the network arrangement comprises "*one of* a ring, mesh, and combination thereof" (see claim 15, for example) or is configured in "a mesh, ring, *or* combination thereof topology" (see claims 29 or 32, for example). Therefore, this limitation in the claims may be met with a disclosure of ring topologies, since the claims only require one of the types of topologies. Nevertheless, Examiner further notes that contrary to Applicant's assertion, Cardwell et al. disclose at least ring topologies *and* ring/mesh combination topologies (Figures 1-4 show nodes connected together as rings or as ring/mesh combinations).

10. Also, Examiner acknowledges Applicant's general comments on pages 16-18 of the response with regard to claims 15-27 and 29-35 that "arguments with regard to Claim 28 apply with equal force here" or "above arguments presented herein apply with equal force here." However, Examiner respectfully notes that claims 15-27 and 29-35 do not recite a means for (or

step of) "forming a subsequent set of optical amplifier placement configurations in accord with and constrained by the initial placement of the selections means, wherein constrained by the initial placement of selections means comprises one of analyzing all possible configurations having the same number of amplifiers as the initial placement and varying losses of the spans and nodes from the initial placement by a predetermined percentage to identify other possible configurations" as recited in claim 28 (or similarly recited in claims 1 and 8). In response to Applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the limitations recited in claim 28) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Y. Leung whose telephone number is 571-272-3023. The examiner can normally be reached on Monday to Friday, 7:30 to 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571-272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christina Y Leung
CHRISTINA LEUNG
PRIMARY EXAMINER